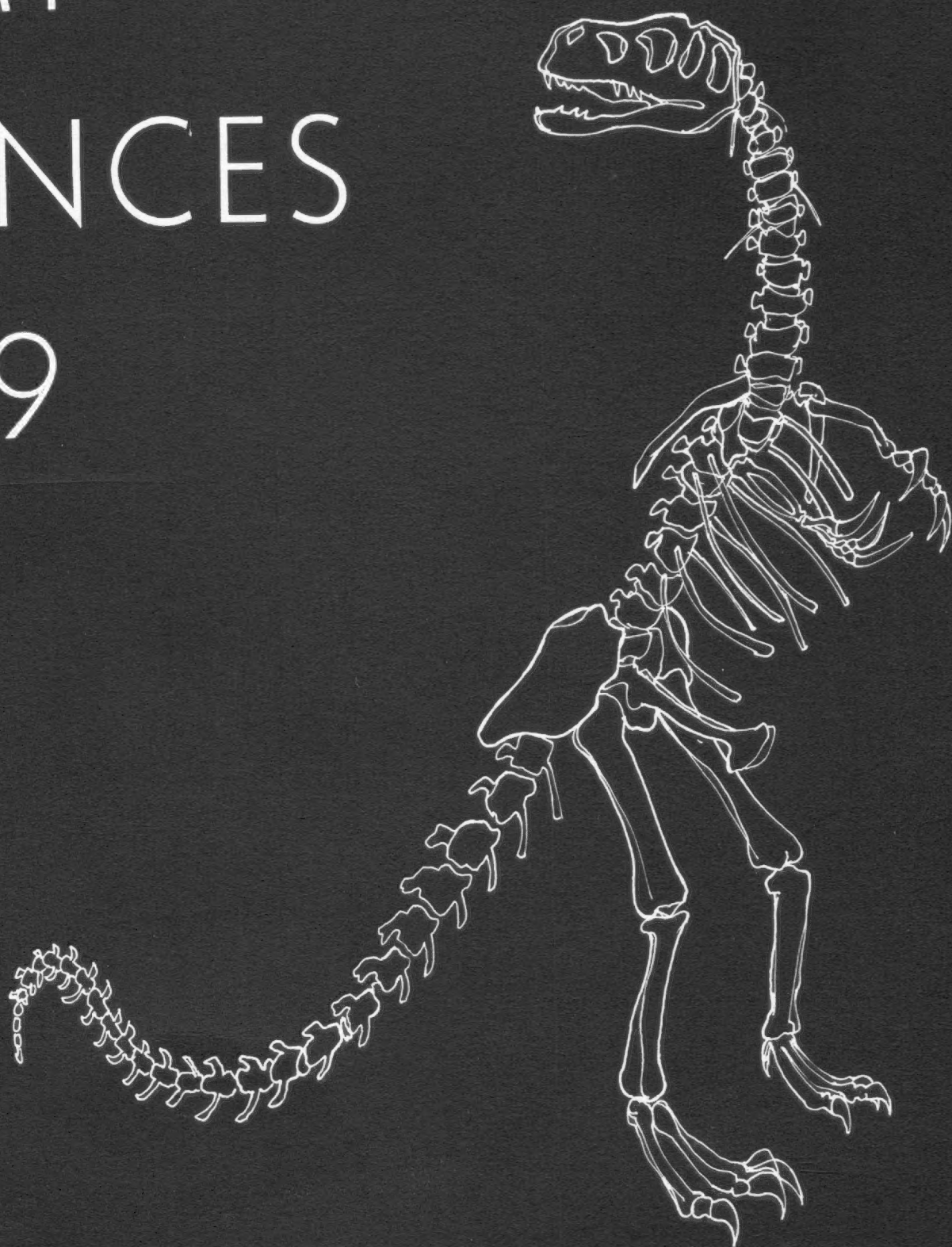


ANNUAL REPORT
OF THE
CALIFORNIA
ACADEMY
OF SCIENCES
1968-1969



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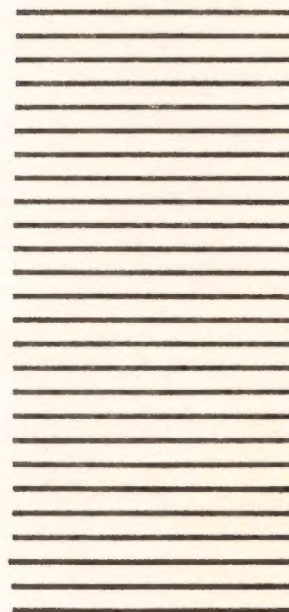
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ANNUAL REPORT OF THE CALIFORNIA ACADEMY OF SCIENCES 1968-1969

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CALIFORNIA ACADEMY OF SCIENCES
GOLDEN GATE PARK, SAN FRANCISCO, CALIFORNIA 94118

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A MESSAGE FROM THE CHAIRMAN

THE past twelve months have been a red-letter year for the California Academy of Sciences. We are now established in Cowell Hall. This handsome building, a gift from the S. H. Cowell Foundation, provides us with a most attractive new entrance for the three million visitors who come to the Academy each year. It also provides excellent restaurant facilities for Academy visitors and for other visitors to Golden Gate Park and has given us beautiful space for the Academy's administrative offices.

This has been a year of substantial increase in the financial support for the Academy's research activities. The support from Bay Area corporations increased. Individual contributions were substantially higher than in the past. Including three sizable bequests, the private support for the Academy's research budget and for endowment exceeded \$1.3 million. For the 1969-70 fiscal year, the budget for the privately supported activities for the first time will exceed \$1 million, or approximately two thirds of the total Academy budget. For the Academy to maintain its position as one of the nation's great natural science museums, we are dependent upon this broadening and increasing community support.

Toward this goal, we have established a major source of annual income, the Friends of the California Academy of Sciences, each of whom gives \$1,000 or more annually to the Academy. Initiated only a few months ago, the Friends already number close to 30. Through the efforts of the Trustees, we hope to increase membership in this group to at least 100. The Friends would then provide approximately 10% of the budget for the science departments, whose support comes from individual and corporate gifts, bequests, foundations, and income from endowment funds.



To maintain and improve the quality of the Academy's research departments in a period of continually rising costs keeps a steady pressure on the Trustees, whose responsibilities include the commitment to see that the Academy's financial needs are adequately provided for. We are fortunate in having qualified and dedicated Trustees whose efforts provide the growing financial support for the Academy. Four new Trustees have been elected to the Board this past year—Christian de Guigne, III, Richard E. Guggenhime, Frank E. Hayward, and Rudolph A. Peterson. They will strengthen the Board in its annual support and endowment fund development efforts.

We are grateful to our friends, the City and County of San Francisco and the individuals, corporations, and foundations of the San Francisco Bay Area, for their generous financial help during this past year.

A handwritten signature in dark ink, reading "E. Morris Cox". The signature is stylized with a large "E" and a cursive "Cox".

E. MORRIS COX
Chairman, Board of Trustees



REPORT OF THE DIRECTOR

THE completion of Cowell Hall in May 1969 was the outstanding accomplishment of the eventful 116th year of the California Academy of Sciences. Such a structure was a key unit of the master plan of Louis P. Hobart when the Academy moved to Golden Gate Park in 1916. Now it is a reality, made possible by a grant of \$1,550,000 from the S. H. Cowell Foundation. It adds 33,860 square feet of public exhibit, office, and utility space. It unifies the Academy's complex of buildings into a whole, provides a gracious

entrance and reception area, and encloses an attractively landscaped courtyard with the Robert B. Howard Whale Fountain. The beautiful building is as modern as today yet is in total harmony with its park setting, and it has already won a coveted national architectural award. Milton T. Pflueger and his associates, particularly James S. Tuley, were the architects; Thomas D. Church designed the courtyard and landscaping; and MacDonald and Nelson were the builders.

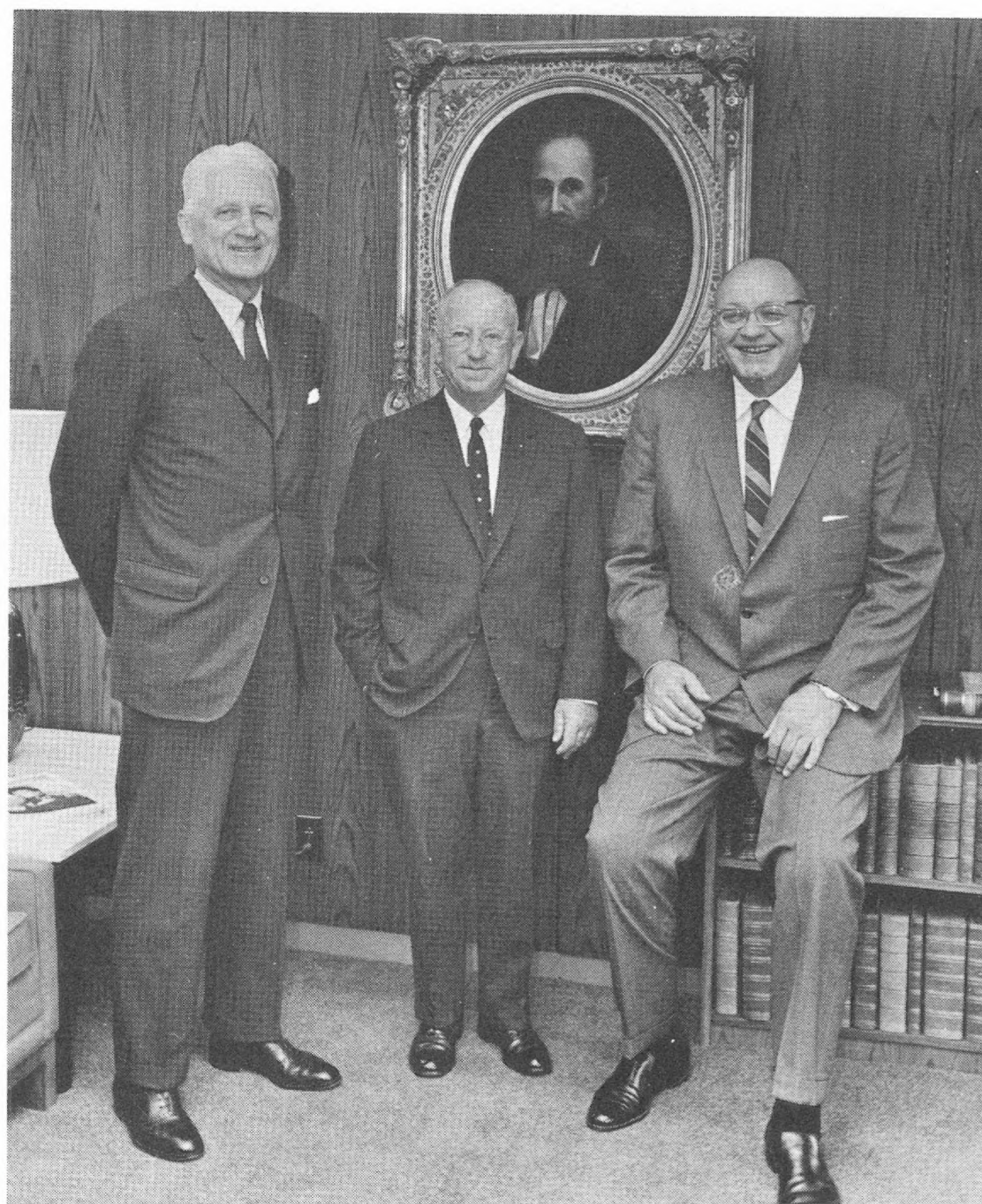
During the twenty months of construction of Cowell Hall normal access to the Academy was blocked, but visitors made their way through temporary or service entrances and business went on more or less as usual. During the report year 2,723,452 people came to the Academy. Perhaps 500,000 of them were students in school groups, on field trips to the aquarium or planetarium. The Academy is the most popular cultural attraction in the western United States and one of the great natural history museums of the world.

HIGHLIGHTS

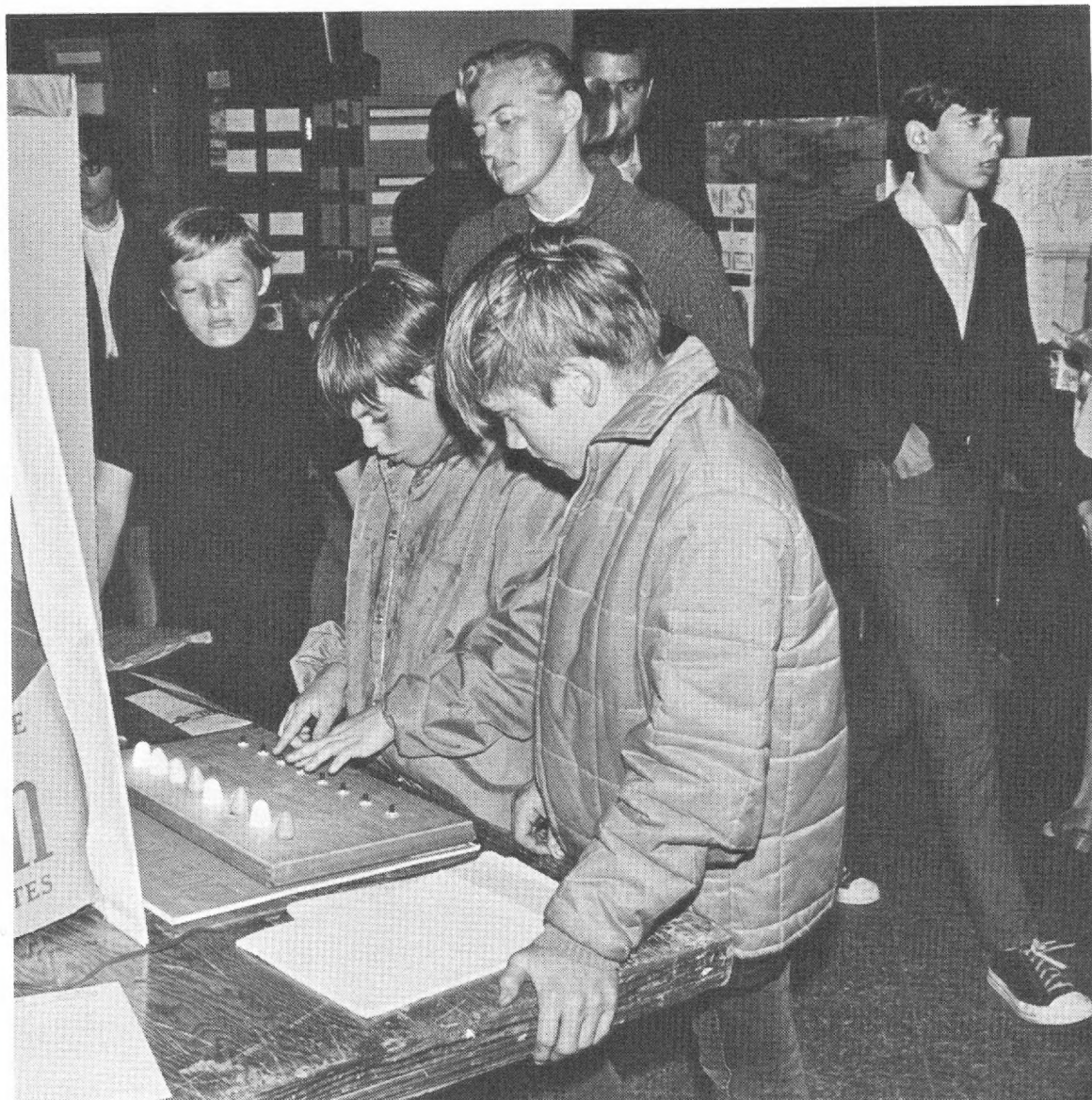
Dr. A. Starker Leopold resumed the office of President on October 21, 1968, succeeding Dr. J. Wyatt Durham who had held the position for two years. Dr. Leopold served previously as President from 1959 until 1966.

The Annual Meeting and Open House was held October 2, 1968, and was attended by 1,200 members and guests. New members were introduced to Academy Trustees and staff at a reception given by the Trustees on November 25 in Steinhart Aquarium. Mrs. Joseph A. Moore, Jr., was chairman for the reception, which was attended by about 200 guests.

The annual Fellows' Banquet was held November 2 in Steinhart Aquarium, followed by the award of the Fellows' Medal to Dr. Tracy I. Storer in Morrison Auditorium. The Fellows' Medal is the Academy's highest recognition for scientific achievement, and in addition to Dr. Storer the recipients have been Ira L. Wiggins, Laurence M. Klauber, Carl L. Hubbs, and G Dallas Hanna. President Leopold gave the address of the evening which was titled "Wildlife Management in East Africa."



Above, Chairman of the Board of Trustees E. Morris Cox, Trustee I. W. Hellman, and Director George Lindsay admired the Academy's new administration offices. Left, A Trustees' Reception on May 14 presented the new Academy facilities to the people of San Francisco.



The 16th Annual San Francisco Bay Area Science Fair was held in April. While the Academy has always been host to this event, in which the 300 finalists among more than 5,000 contestants compete for regional recognition, only this year did it join those organizations which award special prizes. Junior Academy memberships, onyx trophies, and fifty-dollar cash awards were made to William Wesley Kauffman and Lila Scudder Crutchfield.

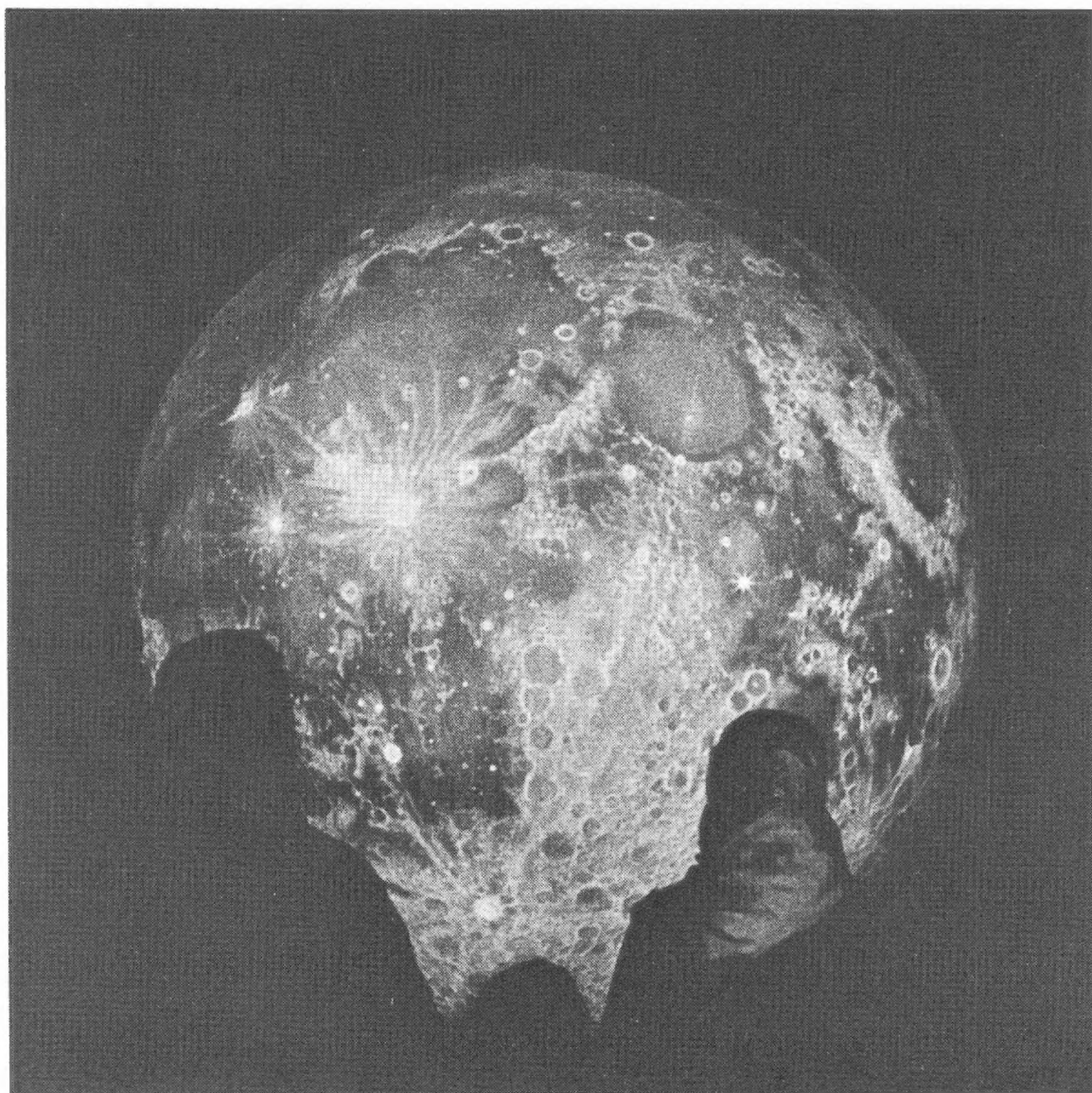
An important event of the year was the receipt of a special grant of \$62,600 from the National Science Foundation for support of the care of the research collections. It provides salaries for seven technicians in the research departments and some equipment and supplies. This federal support is in recognition of the Academy's stature as a national resource for scientific research and its service to the scientific community.

The Edward Hohfeld Hall of Space Science was dedicated May 2, 1969 and the dedication of Cowell Hall was on May 16. There were several evening receptions in conjunction with the opening of Cowell Hall, which was a milestone in the history of the Academy.

The American Association of Museums held its 64th Annual Meeting in San Francisco May 25-29, with the Academy serving as one of the host institutions and Director Lindsay as Program Chairman. A reception and open house for the delegates was given at the Academy May 25.

FIELD WORK AND EXPEDITIONS

Dr. Stanley C. Williams, Research Associate in Entomology, spent the summer of 1968 and the spring and summer of 1969 investigating the scorpion fauna of Baja California and adjacent areas of Mexico. Dr. Williams' work was supported by a grant from the National Science Foundation made to the Academy in May 1968. During that summer Williams and his assistants, in the company of Dr. Mont Cazier and graduate students from Arizona State University, traversed the length of the peninsula and collected more than 40,000 scorpions, mostly at night, using ultra-violet lights which make the arachnids conspicuous because they fluoresce. In 1969 Williams and assistants accomplished several additional months of field work on the peninsula during which they were able, through the courtesy of Mr. and Mrs. Thomas P. Hearne of San Diego, to collect on



Top, the 16th Annual San Francisco Bay Area Science Fair attracted hundreds of contestants and thousands of their proud friends, teachers, and parents. Above, the moon exhibit in the new Edward Hohfeld Hall of Space Science is one of the most popular in the Academy. Right, Robert E. McClure became Business Manager in February, 1969, following the untimely death of J. Byron Warner, who had served the Academy since 1962.





Above, Professor Joseph Wood Krutch, left, Mrs. Kenneth Bechtel, General Charles Lindbergh, and Academy Trustee Kenneth Bechtel visited a natural desert botanical garden in Baja California while surveying areas which deserve conservation. Above right, in Pakistan Dr. Earl S. Herald observed natives fishing for blind river dolphins. Right, Dr. Herald held a rare blind river dolphin for photographs and medical treatment before it was sent to Steinhart Aquarium.



several islands in the southern Gulf of California. Dr. Williams made large collections of arachnids and other arthropods in addition to the scorpions, and obtained important records of the herpetofauna of the peninsula as well.

In July 1968, Mr. and Mrs. Kenneth K. Bechtel made it possible for an Academy party consisting of Director Lindsay, Associate Director Robert T. Orr, Curator of Geology G Dallas Hanna, and Mrs. Hanna to go to the Pribilof Islands and Point Barrow, Alaska.

Dr. Earl S. Herald, Associate Director for Steinhart Aquarium, led an Academy expedition to West Pakistan to study and collect living specimens of the little-known blind river dolphin, *Platanista gangetica*. His associates were Fredric L. Frye, D.V.M., Elkan J. Morris, photographer, and Robert L. Brownell, Jr., cetologist.

Departing on October 18, 1968, the party traveled via Tokyo, Manila, Bangkok and Karachi. From there a 320 mile overland trip and a short ride in a pole boat took the scientists to their field headquarters on Tappu Island in the Indus River above Lloyd Barrage. Three dolphins were captured during a nine-day stay, and various preliminary experiments and observations were made. The live animals were transported by pole boat, then train, to Karachi, and from there by air to Tokyo, where they had a rest stop, then to San Francisco.

The susu or blind river dolphins live in turbid fresh

water and their eyes have degenerated. Their bio-sonar is apparently very highly developed, and their skulls are unlike those of any other animal.

Although the little dolphins survived only a few weeks in captivity, they were studied by many specialists and provided much important information about a very interesting and highly specialized animal.

In October 1968, Director Lindsay accompanied Academy Trustee Kenneth K. Bechtel, Mrs. Bechtel, Charles A. Lindbergh, and Joseph Wood Krutch on a five day aerial survey of areas in Baja California and its adjacent islands which the Mexican Government should be encouraged to protect.

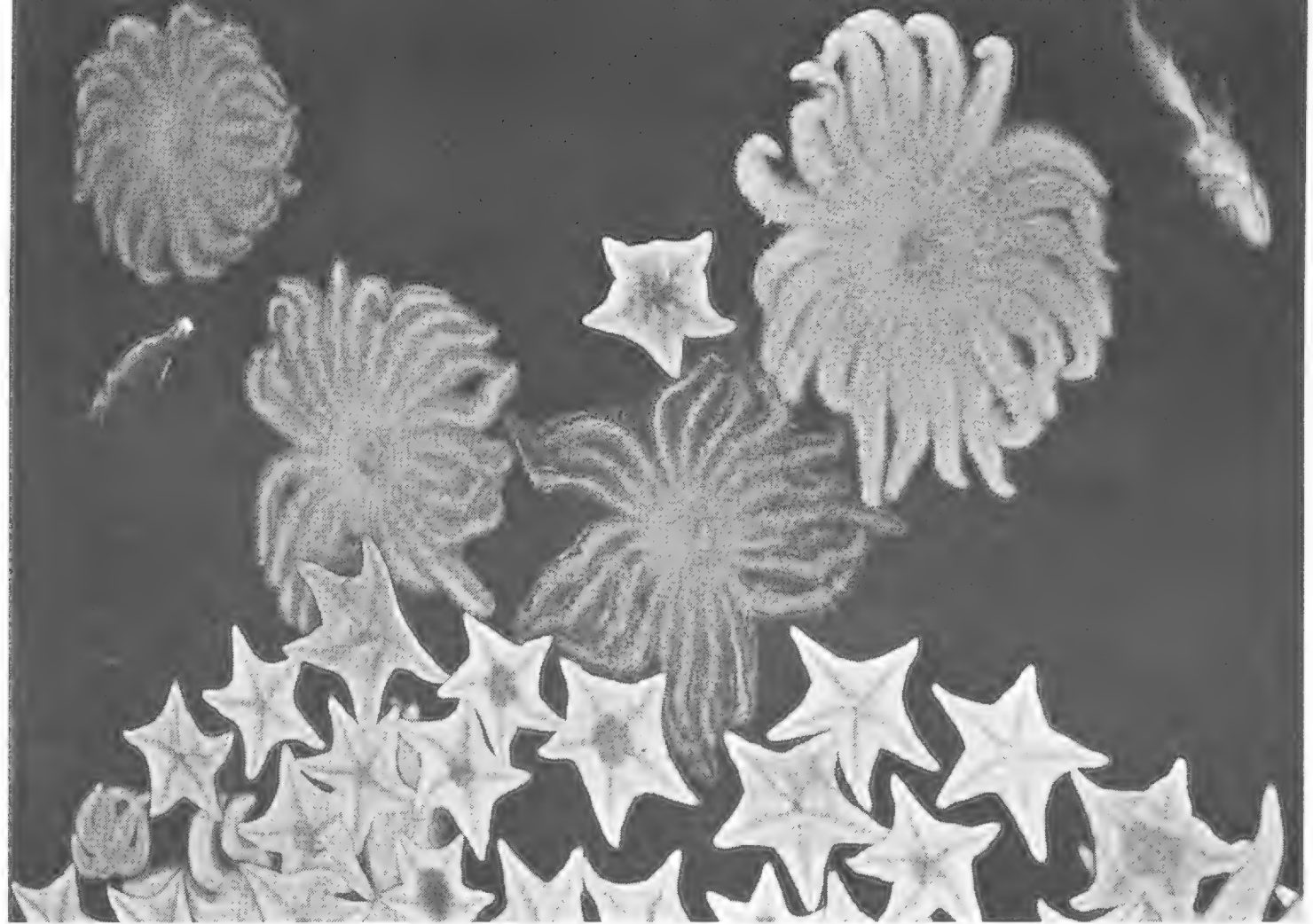
Dr. Laurence C. Binford, Assistant Curator of Birds and Mammals, accompanied Dr. Joseph R. Jehl, Jr., of the San Diego Society of Natural History on a cruise to the islands off the west coast of Baja California on April 7-17, 1969. They were guests of Mr. and Mrs. Richard Dwyer aboard their research vessel "Sea Quest," and investigated the effect that pesticides may be having on the eggs and reproductive capacity of brown pelicans and other marine birds.

Field work is a normal and necessary part of our studies of the kinds of plants and animals with which we share the world. Every member of our scientific staff is involved in field investigations to some degree.



Dolphins, fish, starfish, and a manatee were among the popular attractions of Steinhart Aquarium.





STEINHART AQUARIUM

An enormous collection of living aquatic animals, beautifully displayed, makes Steinhart Aquarium the most popular department of the Academy. Associate Director Earl S. Herald is Department Chairman, and is in charge of all aquarium functions. In the European tradition, Steinhart Aquarium also exhibits a large collection of amphibians and reptiles, many of which are terrestrial or even arboreal. The living animals of the aquarium are responsible for much of the Academy's phenomenal visitor use.

During the year more than 20,000 specimens were collected, purchased or received as gifts or by exchange. In addition to his journey to Pakistan to obtain the never-before-exhibited blind river dolphins, Dr. Herald led two collecting trips in the Gulf of California. Many of the most interesting display animals, including colorful invertebrates, were obtained off our coast by the diving staff of the aquarium. An outstanding gift arranged by Academy Friend Porter Sesnon was a rare primitive reptile called a tuatara, from islands off New Zealand, presented by the Honorable Robert Muldoon, Minister of Finance, and the Honorable John G. Hale, Counsel General. Very few tuataras have been released by the New Zealand Government.

Aquatic animals are very sensitive to their environment. Water temperatures and salinities must be carefully maintained. Unseen by the visitor is the staff of engineers, aquarists, aquatic biologists, and others which works 24 hours every day of the year. The engine rooms of the aquarium are like those of a ship, with boilers, refrigerators, filters, and miles of pipe. Water temperatures are monitored and alarms sound if they vary. The salinity of ocean water from the beach pumped through three miles of transite pipe is constantly recorded.

While public education and entertainment are the principal functions and obligations of Steinhart Aquarium, basic research in the systematics and physiology of aquatic animals is a continuing activity, as is applied research in aquarium techniques, treatments for water and for diseases of fishes and reptiles, the parasitology of those organisms, etc. Some of this work is sponsored by the Office of Naval Research.





Left, Junior Academy members Mark Ghiorso and Dennis Fullalove studied fossil fishes collected on a field trip to Hazen, Nevada. Above, Junior Academy summer classes were filled to capacity. Ten course subjects were offered and more than 300 youngsters participated.

MORRISON PLANETARIUM

Captain Robert D. Risser, U.S.N. (Ret.), Supervisor. The Alexander F. Morrison Planetarium presented 864 public performances which were attended by 138,707 persons who paid admission, 5,700 Academy members using complimentary tickets, and about 6,100 others. The paid admission attendance was 15 percent higher than that of the previous year, and the fourth highest since the planetarium opened seventeen years ago. The 2,000,000th admission ticket was sold on Washington's Birthday. Special educational programs were attended by 47,648 school children in class groups, which was 5,621 less than the previous year. The total attendance for the year was approximately 200,000.

The long program for refurbishing the planetarium was completed, without canceling any performance. The cork floors were refinished, aisles and the central instrument island were carpeted, seats were reupholstered, and walls were repainted. These improvements were financed from part of a special bequest for the planetarium from the late Dr. C. M. Goethe.

Chief Technician Steven B. Craig continued his responsibility for the development of special projectors and devices for the different visual and sound effects required for planetarium performances. In addition, Mr. Craig accepted the position of Superintendent of the Instrument Shop after the sudden death of Alvin C. Gundred on May 26, 1969.

Richard D. Warren joined the staff as Assistant Supervisor to replace Chance Massaro, who took a leave of absence for extended travel in Europe.

Captain David W. Todd, Jr., U.S.N. (Ret.) gave a course in celestial navigation, Michael A. Bennett presented

a course in modern astronomy, and Captain Risser taught a course called "Astronomy for Fun." These were given in the fall of 1968.

JUNIOR ACADEMY

Kenneth E. Lucas, Supervisor and Darrel R. McKenzie, Instructor. The California Junior Academy of Sciences provided science classes for nearly 500 young members, age 10-21 years. The Juniors, age 10-15, met on Saturday during the school year, and had a choice of ten specialized six-week courses during the summer. Senior members, age 16-21, undertook independent study in an area of their choice, and the Academy provided supplies, equipment and professional guidance. Field trips and investigations are an important part of the Junior Academy program.

The ten courses offered in the greatly expanded summer series in 1969 were Aquatic Organisms, Astronomy (given in the planetarium), Diseases of Man, a field course in Entomology taught by Thomas Briggs, Intertidal Invertebrates (Marine Biology) by Dustin Chivers in which parents participated, Herpetology, Natural History of California, Ornithology taught by Dr. Laurence C. Binford, Physical Geology, and Prehistoric Life. This was by far the most ambitious summer program ever offered by the Junior Academy.

Utilizing a camper truck given by Trustee I. W. Hellman, and with grant support from the American Association for the Advancement of Science, a new series of field projects was started during Christmas vacation. Ten students, under the direction of Dr. Victor A. Zullo and Mr.



Lucas, collected fossils in the Kettleman Hills. Other field trips were to Death Valley National Monument, to fossil localities in Nevada, and to many closer places.

The members of the Junior Academy are fortunate in having strong interests in learning about their world. They are willing to invest their time in courses of study. We know from experience that many will be the doctors and biologists and chemists and physicists of tomorrow. And we know that all will retain a respect for and appreciation of the natural world which will make their lives more rewarding.

TITLE III PROGRAM

Early in 1969 an Elementary Science Resource Center Office was established at the Academy by the San Francisco Unified School District, funded with \$75,000 under Title III, ESEA (Public Law 89-10). Its purpose was to develop a pilot program in elementary science using gifted children and selected fifth grade classes of mixed ethnic backgrounds. Three teachers in residence along with a teacher aide selected outstanding fifth grade students who were trained as guides or docents to work with small groups of students of similar age in science instruction, using the Academy exhibits for this purpose. This program was eminently successful and over 200 children participated. The teachers were Darlene Lau, Dolores Tighe and Sheilagh Louis. The teacher aide in service was Virginia Ryder. This program, developed by Mr. Isadore Pivnick, Assistant Superintendent for Innovative Planning for the San Francisco Unified School District, will continue in the fall of 1969.



Above, a pilot parent-child class studied marine invertebrates under the direction of Dustin Chivers. Left, more than 200,000 persons attended sky shows in Morrison Planetarium during the year.

The Lucie Stern Room houses the rarer books in the Academy's J. W. Mailliard, Jr. Library. Laurie Umeh is comparing recently received material with a botanical work from the Edward E. Hills and Florence Hopkins Hills collection.



J. W. MAILLIARD, JR., LIBRARY

Ray Brian, Librarian. The J. W. Mailliard, Jr., Library provides service to the Academy staff and departments, Academy members, and scholars who come to the Academy, and to other scientific and educational institutions. Libraries in 25 different states and several foreign countries were supplied references or photocopies as an interlibrary loan service, and hundreds of graduate students and others did their research here.

Library Associates Julian Arntz, Margaret W. Campbell, Anson Herrick and Jessie Saunders, and Library Volunteer Paul H. Anderson gave their professional services on a regular basis and increased greatly the capabilities of the employed staff. Without those generous volunteers library service would be greatly reduced.

The library managed the exchange of Academy scientific publications for those of 647 other institutions, foreign and domestic. This insures the availability of Academy publications in all major scientific research libraries. The library is also responsible for the specialized libraries located in each Academy department.

PICTURE COLLECTION

Johan Kooy, Chairman. This department houses historical photographs relating to the Academy and its expeditions, thousands of natural history slides, original

works of art related to natural history subjects, and the rapidly growing Reference Picture Collection.

During the year the department moved from its former cramped quarters into newly decorated facilities, more than four times as large, on the second floor of the North American wing. The new area makes more efficient processing and storage of collections possible, and provides work space for more volunteer assistants.

The Reference Picture Collection is under the direction of Departmental Associate Paul Anderson, who, in addition to contributing his time and expert knowledge on a regular and continuing basis, has given the collection and the department very substantial financial assistance.

Departmental Associate Muriel French organized the collections of color transparencies and original art work, which expanded rapidly during the year with significant gifts from Miss Sherry Ballard, James Johnson, Alden Johnson, and G. W. Robinson.

With the exception of Mr. Kooy, the entire staff of the Picture Collection is composed of volunteers, twelve of whom work regularly and are in charge of particular activities.

The acquisition of some very fine engravings and other prints, as well as departmental furniture and projection equipment, was made possible by generous gifts from Mr. Paul Anderson, Mrs. Somers Peterson, Miss Muriel French and the Frank Campini Foundation. Mr. Anderson also provided funds for the preparation of the new home of the Picture Collection.



Above, Robert C. Miller, Bruce Finson, George Lindsay, Johan Kooy, Robert T. Orr, and Robert I. Bowman (not shown) serve on the Editorial Board of *PACIFIC DISCOVERY* magazine. Below, the Picture Collection occupied new quarters, a corner of which is shown here. Volunteer assistants are particularly important to this department.

PACIFIC DISCOVERY

Bruce Finson, Editor, and Johan Kooy, Art Director. Mr. Finson, in a paper delivered at the Western Museums League meeting in Santa Barbara, presented the philosophy of our bimonthly magazine, *Pacific Discovery*. He said it is not only a natural history magazine, it is, specifically, the magazine of the California Academy of Sciences and as such it reflects the interests of the Academy. These interests focus on the taxonomic and evolutionary biology of the Pacific Basin, with a generous sprinkling of side interests in other areas. In consonance with this, the epigraph for *Pacific Discovery* is "A Journal of Nature and Man in the Pacific World." Man is included as one species among the local fauna, and is sometimes discussed in terms

of the extreme effects his tool-making and reproductive capabilities have upon the balance of the biosphere.

But *Pacific Discovery* is not a house organ. Only one column, Hal Richardson's "Academically Speaking" regularly relates directly to the Academy. The *Academy Newsletter* takes care of announcements to the membership, reports of staff activities, or notices of official business. *Pacific Discovery* is a natural history journal of clearly defined range, in tone between the popular and the technical, in format well illustrated and elegantly produced. Thus it may serve as the representative of the Academy to the public.

Mr. Finson and Mr. Kooy, assisted by Editorial Board members Robert I. Bowman, George E. Lindsay, Robert C. Miller, and Robert T. Orr, are responsible for *Pacific Discovery*.



EXHIBITS

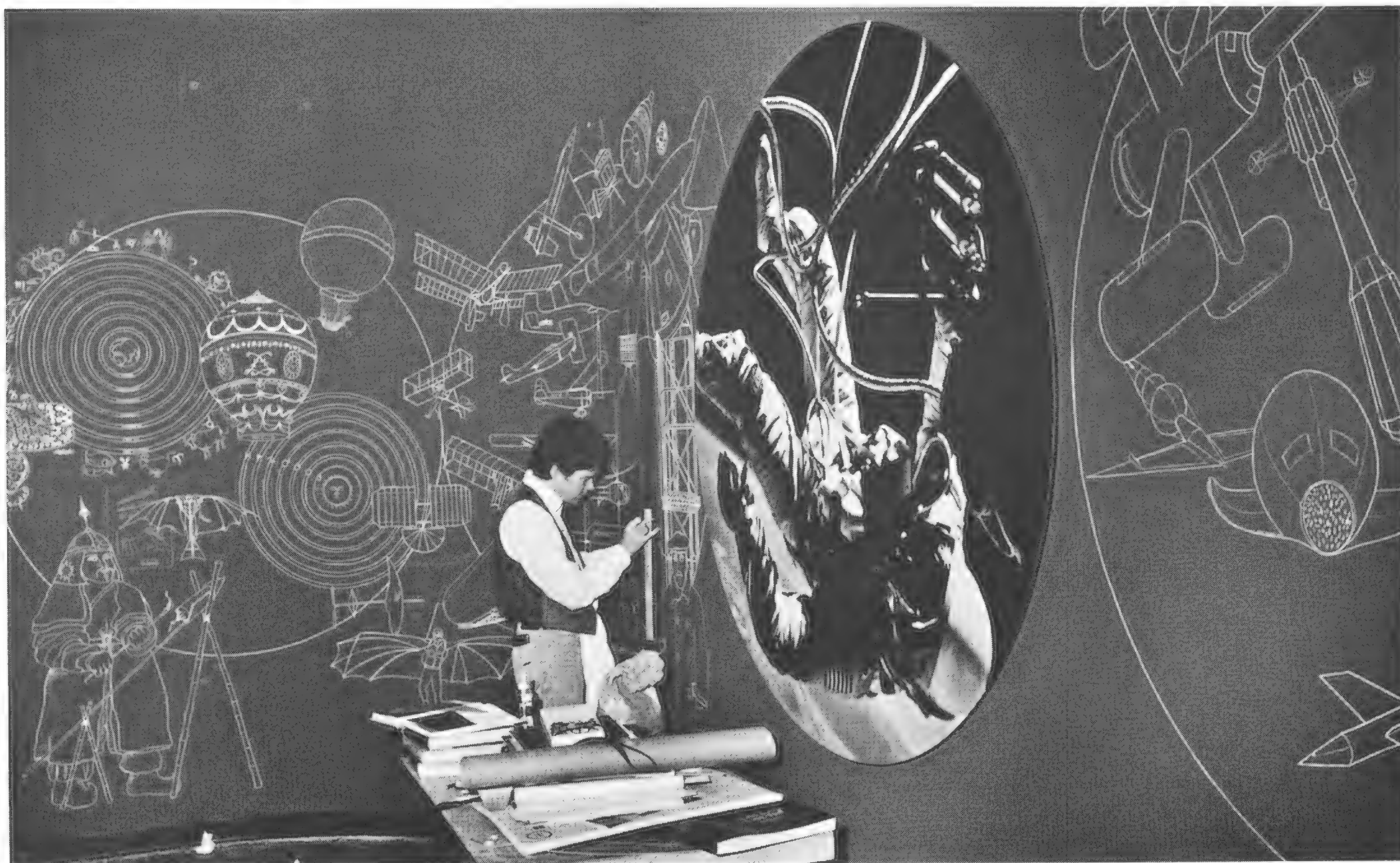
Ernest R. Rook, Chairman and Curator. This year saw the installation of several long-awaited and very important exhibit features. On May 2 the Edward Hohfeld Hall of Space Science was dedicated in memory of the distinguished man whose strong interest made Morrison Planetarium possible. The new hall has a mural by Richard Cook showing the history of flight from mythology through man's first walk in space. Another wall is devoted to fifteen large illuminated color transparencies of astronomical objects: planets, comets, stars, constellations, and galaxies. But the most dramatic feature of the hall is the moon theater, which displays a three-dimensional, six-foot topographical model of the moon suspended darkly in space. The Edward Hohfeld Hall of Space Science is not complete, nor will it ever be. Mrs. Hohfeld, in addition to sponsoring the hall, provided an endowment which will enable the Exhibits Department to continually improve and update its presentation of man's advances in space.

Another important addition is the dinosaur which was installed just in time for the opening of Cowell Hall. Many years ago the Academy financed summer field work by the University of Utah, and in return was provided with a dinosaur skeleton, loose-packed in boxes of sawdust. The fossilized bones had been unearthed and partially cleaned by the students, but some pieces were missing, and a great deal of work remained to be done. Arrangements were made with Mr. James H. Madsen, Jr., Curator of the Museum of Earth Sciences of the University of Utah, to complete the

project and to deliver an articulated, mounted specimen. It took eighteen months to assemble the great beast, *Allosaurus fragilis*, which died some 140 million years ago. Mr. Madsen and his assistants did a superb job. The steel support rods are entirely concealed, and the animal has a natural stance. We hope that this is but the first of several kinds of dinosaurs which will someday be displayed by the Academy.

Jade by the ton has been added to the mineral exhibit collection, through the generosity of five Californians. Miss Josephine L. Scripps, of San Luis Rey, presented a jadite boulder weighing 4,150 pounds, which she collected from Clear Creek, San Benito County. Miss Scripps' friends, Mr. and Mrs. Jerome Buteyn of Fallbrook, gave a beautiful nephrite boulder weighing 1,330 pounds which was collected by divers from the ocean bottom at a depth of 100 feet off Monterey. Then Mr. and Mrs. Lewis K. Land of San Francisco donated a quality jadite "slick" weighing 890 pounds, which came from northwestern British Columbia. The three fine specimens are located in Cowell Hall near the entrance to the Hall of Minerals.

The Exhibits Department was completely reorganized and largely restaffed during the year. The former chairman, Mearl F. Carson, resigned in order to become Director of the Palo Alto Junior Museum, and Mr. Rook was appointed Chairman and Curator. Three talented young men were recruited, Richard Cook, Jerry F. Glover, and Herbert E. Pruett. With Alberto A. Cacicedo, cabinetmakers Konstantin Kurkin and Herbert Swanson, and volunteer Exhibits Associate Verdi Miller, the department now has the talent, vigor and enthusiasm to accomplish great things in the exhibits field.





PUBLIC INFORMATION



Hal Richardson, Public Information Officer. Because of its highly diversified and ever-changing activities, there is always interest as to what is occurring at the Academy. All of the news media—press, television, radio and wire services—receive articles and photos during the year which abets considerably the consistent heavy attendance.

Acquisitions for Steinhart Aquarium received wide publicity: the arrival of the gray manatee, the paddlefish, the rare reptile relative from New Zealand called a tuatara, and the three blind dolphins who flew air freight from Pakistan. The topicality of Morrison Planetarium's sky shows such as "Icarus" and "Astrology: Queen of Science" made them highly successful at the box-office. Dr. Robert T. Orr figured nationally in dozens of news items dealing with the incidence of dead whales at the time of the oil leakage off Santa Barbara.

The publication of a handsome brochure, "The Museums of San Francisco," which was a joint effort of the city's museums and the San Francisco Convention and Visitors Bureau, was due to the efforts of Mr. Richardson aided considerably by Messrs. Rook and Pruett of the Exhibits Department.

Mr. Richardson authors the *Academy Newsletter* and the column "Academically Speaking" for *Pacific Discovery*. He is also responsible for the programs of the monthly membership meetings, arranges for the Annual Meeting and Open House, and receives and entertains distinguished guests from here and abroad.

As she has for many years, Mrs. Walther Buchen maintains the departmental press books, a volunteer service for which we are grateful.

Left, artist Richard Cook made a mural showing the history of flight for the Edward Hohfeld Hall of Space Science. Above, a young visitor admiring an exhibit in Cowell Hall. Top, the Edward Hohfeld Hall of Space Science was dedicated on May 2, 1969. Its exhibits include a wall of photographic transparencies of celestial subjects.

The renovation of the Department of Ichthyology and the incorporation of the George Vanderbilt collection of fishes with that of the Academy was completed during the year with the support of the National Science Foundation. Far right the fur seal colonies on St. Paul Island were visited by Dr. Robert T. Orr, Dr. and Mrs. G Dallas Hanna, and Director Lindsay as guests of Mr. and Mrs. Kenneth Bechtel.



RESEARCH ACTIVITIES

The California Academy of Sciences is the oldest scientific organization in the western United States. For more than a century it has served as a center for research in the life and earth sciences, as a repository for and guardian of vast collections of scientific specimens, and as a publisher of scientific papers. The responsibility for the accumulation and care of collections and of building an inventory of the plants and animals of the earth was once shared between natural history museums and some of the great universities. But universities throughout America are being forced by competing interests to curtail their limited support of adjunct herbaria, museums, and biological collections of all sorts. Those collections are foundation stones of biological research, and they must be preserved and expanded as dynamic, growing enterprises. As the major natural history museum in the western United States, the collections and associated research activities of the Academy are moving forward. The systematic classification of natural history objects, or taxonomy, is our main scientific contribution. The inventory of nature is far from complete, and many organisms are not yet described. Systems of classification of many groups are not yet perfected, and do not reflect evolutionary origins and relationships. The thrust of Academy research is in those areas.

Support of vast systematic collections is burdensome, as has been found by universities. And systematic collections are used, directly or indirectly, by the whole scientific community. In recognition of this, and of the Academy's stature as a national research resource, the National Science Foundation in January granted \$62,600 to help care for its

collections. Seven technicians are employed under the grant, to relieve professional staff members of some of the house-keeping chores of the collections. Additional funds were made available for the purchase of research and collection storage equipment. This is possibly the most important grant received by the scientific departments of the Academy.

The Science Council is a standing committee of the Board of Trustees, chaired by the President of the Academy and including Trustees and staff members, to advise the Director in matters pertaining to scientific activities. A. Starker Leopold is Chairman, Ralph Emerson Vice-chairman, and Alan E. Leviton Secretary of the Science Council. Paul Arnaud, Ian Campbell, J. Wyatt Durham, Robert T. Orr, Thomas Tilton, Victor Zullo, and George Lindsay (*ex officio*) were the other members.

BOTANY

Elizabeth McClintock, Acting Chairman and Curator. John Thomas Howell, who was Chairman and Curator of the Botany Department, retired on December 31, 1968. He was made Curator Emeritus on January 1, 1969, and continues his active association but relieved of some of the time-consuming administrative chores. Mr. Howell first worked for the Academy in the summer of 1929, and in 1930 he became Assistant Curator, a position he held until the retirement of Alice Eastwood in 1949 when he became Curator.

During the year 7,511 mounted specimens were added to the herbarium, which contains some 482,500 vascular plants. The department received 10,769 specimens



as gifts, exchanges, and through staff collections, and it sent out 33,410 specimens to 43 institutional herbaria, representing an accumulation of duplicate specimens over the past decade. Twenty-three institutional herbaria borrowed 3,117 specimens during the year.

Dr. McClintock held an academic appointment at San Francisco State College as Lecturer in Botany and taught a class in taxonomy during the fall semester. She was President of the California Botanical Society during the year 1968. In continuation of her work on the genus *Spiraea* she made field trips to Nevada, and she also worked on the flora of the Pixley vernal pools in Tulare County, which have been preserved by The Nature Conservancy.

Dr. McClintock worked with the Strybing Arboretum staff in the preparation of a checklist of the Arboretum's plants. She also cooperated with Professor A. T. Leiser of the University of California at Davis in a survey of the ornamental trees and shrubs of the Capitol grounds in Sacramento.

Mr. Howell prepared the enormous backlog of exchanges for distribution before his retirement in December. He conducted field work in the Butterfly Valley of Plumas County with Walter and Irja Knight, Gordon True, and Lewis Rose. Mr. Howell and Mr. True made an extended field trip to Utah, Arizona and Nevada in September, and into the Sierra Nevada in April, this in continuation of Mr. Howell's flora of the Sierra Nevada and Mr. True's flora of Nevada County. In May they worked with Ernest Twisselman on the Kern Plateau, in cooperation with the U.S. Forest Service.

Research Associates and other volunteer assistants performed many services and provided many hours of labor for the department.

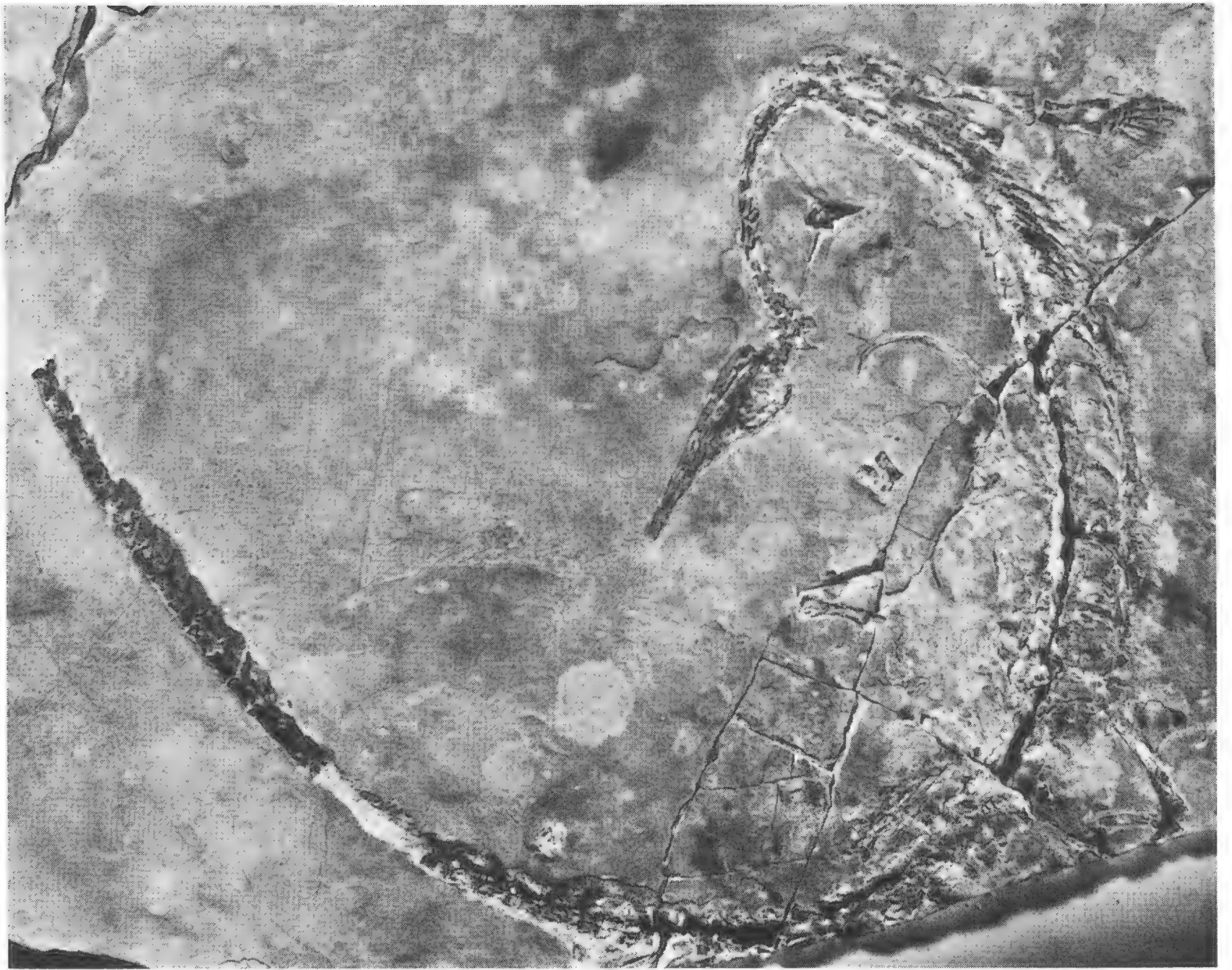
ENTOMOLOGY

Paul H. Arnaud, Jr., Chairman and Associate Curator. The entomological collections contained 3,660,000 fully processed specimens at the start of the year, and 177,454 were added during the report period. An estimated backlog of 2,000,000 specimens remains to be accessioned. There are now 9,033 primary type specimens in the collection.

Of the 177,454 specimens accessioned during the year, 148,541 were gifts from 187 persons and institutions. Some outstanding collections were received from Paul S. Bartholomew, R. W. Dawson, B. E. White, W. H. Nutting, J. D. Birchim, and Curators Paul H. Arnaud, Edward S. Ross and Hugh B. Leech. Many gifts, though smaller in number of specimens, were as important as the larger ones because they included type specimens and other valuable material.

A total of 74,204 specimens were loaned during the year, to 69 institutions and 170 individuals, most of them graduate students in the United States and eight foreign countries. The selection, packing, shipping, and record keeping of these loans is a heavy task, as is their replacement in the collection when they are returned.

Dr. Arnaud continued the preparation of a host catalog of North American Tachinidae, with support from the U.S. Department of Agriculture. The tachinids are parasitic flies important in the biological control of potentially dangerous pests. Dr. Ross made much progress in the preparation of his monograph of the Embioptera. Dr. Dyrce Lacombe of Rio de Janeiro spent several months at the Academy, completing a beautifully illustrated chapter on



the internal anatomy of the web-spinning insects. Dr. Kessel continued work on the taxonomy and biology of the flat-footed flies, Platypezidae, with summer field work in the Willamette Valley and coastal Oregon, and Mr. Leech carried on investigations into the taxonomy of Nearctic water beetles.

The addition of two full-time scientific assistants to the Entomology Department staff, with the sponsorship of the National Science Foundation, was timely. At the end of the year the department had begun its expansion into 3,530 square feet of space released when the administrative offices moved into Cowell Hall. Reorganization of the collections involved moving 501 insect storage cases and thousands of insect drawers. The new assistants, as well as several college students working under the EOA Work-Study Program, were a great help.

McGraw-Hill Company contracted with the Academy to supply several series of nature illustrations for elementary school classes. This involved procuring 180 suitable color photographs to be printed on 13 x 18 inch cards, and producing caption material to be printed on the reverse side of each card. Dr. Ross devoted much of his time to this important project. The prints will be used in schools throughout the United States.

GEOLOGY

Victor A. Zullo, Chairman and Associate Curator. During the year 851 lots of specimens were added to the various collections of the Geology Department, bringing the total to 41,780, in addition to the extensive microfossil and mineral collections. Dr. Leo G. Hertlein continued his supervision of the type collection, to which 84 specimens were added, bringing the total to 13,212.

There was considerable reorganization of the department's facilities. The rapidly expanding mineral collection, under the supervision of Honorary Curator of Minerals Charles W. Chesterman, was moved to large, renovated quarters on the second floor of the North American wing, and new geology cabinets were provided to house the specimens. Dr. G Dallas Hanna moved his office-laboratory to the second floor also, and the microfossil collections are located there. The large departmental library room on the ground floor was partially cleared in preparation for the construction of several offices.

Mr. and Mrs. Louis K. Land presented a magnificent fossil mesosaurian reptile from the early Mesozoic of Brazil, a beautiful jadite "slick" weighing 890 pounds from British Columbia, an extraordinary specimen of rose quartz crystals on quartz from Brazil, and eleven other exhibition quality minerals. Mr. John B. Jago donated 1,500 mineral specimens from world wide localities, and 53 meteorites and 13 tektites were accessioned from the John W. Hilton collection. Mr. Richard Lutz donated 144 choice macro mount mineral specimens. There were many other significant gifts which added to the department's holdings.

Dr. Zullo continued his research on fossil and recent barnacles and on late Cenozoic fossils of the Pacific Coast. Dr. Hertlein's research included the Pliocene fauna of San Diego, and the fossil and recent mollusks of the Galápagos Archipelago. Dr. Hanna concentrated on curating and describing collections of Eocene diatoms, largely from the South Atlantic Ocean, in cooperation with Dr. A. L. Brigger. More than forty years ago Dr. Hanna started the preparation of an index to Schmidt's monumental *Atlas der Diatomeen-Kunde* to facilitate his own research. The project extended over several decades, and the index became increasingly valuable to all diatomists. This year it was

Left, *Brazilosaurus sanpauloensis* is the name of a swimming reptile which lived in South America long ago. A rare fossil specimen was given to the Academy by Mr. and Mrs. Lewis K. Land. Below, large tent-shaped traps are used by Dr. Paul Arnaud to collect tachinid flies and other insects. The tachinids are parasitic on other insects and are important in the biological balance. Right, there are 475,000 sheets of pressed plants in the herbarium.



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published by J. Cramer in a 208 page folio-size volume. This is an important contribution. Research Associate Alan J. Galloway continued his studies of the geology of the Point Reyes Peninsula, the field work for which has been completed. He also served as President of the Le Conte Geological Club and as a Trustee of the Academy.

HERPETOLOGY

Alan E. Leviton, Chairman and Curator. The collections contain about 125,000 reptiles and 65,000 amphibians, including the Stanford University collection which has been transferred to the Academy. In addition, 6,692 specimens were accessioned during the year, including 752 reptiles from Afghanistan from Richard and Erica Clark, 2,449 amphibians from New Guinea and the Solomon Islands through a cooperative field program with Harvard University, 104 amphibians and reptiles from the Ryukyu Islands from Clifford Johnson, 1,612 lizards from western Mexico collected by Allen Greer and William Burley, 67 reptiles from the interior of Arabia sent by Field Associate John Gasperetti, and 844 amphibians and reptiles from the Colombian Choco sent by Borys Malkin.

The work of moving and incorporating the Stanford collection continued through the year. The department has an outstanding research collection, but insufficient office, library, laboratory and specimen storage space. The department must be enlarged. Facilities for the staff, guest scientists who frequently use the collection, and graduate students working under Dr. Leviton, are less than adequate.

Dr. Leviton and Associate Curator Steven C. Anderson concentrated their research on Asian herpetology. Dr. Anderson received a travel grant of \$1,000 from the American Philosophical Society and at year's end was visiting

Dr. Stanley C. Williams, Research Associate in Entomology, spent several months in Baja California collecting scorpions. He brought back more than 40,000 specimens in connection with his National Science Foundation supported studies.



collections in Eastern museums, working on the systematics of Iranian lizards. Dr. Leviton investigated the utilization of computer facilities by personnel of the American Museum of Natural History and the U.S. National Museum, for the purpose of evaluating the possible usefulness of the time-share computer system at the Academy. He also served as Secretary of the Science Council.

ICHTHYOLOGY

William N. Eschmeyer, Chairman and Associate Curator. The major project during the year was the completion of the incorporation of the George Vanderbilt Foundation collection of fishes with that of the Department of Ichthyology. This was sponsored by a National Science Foundation grant of \$177,600 of which Earl S. Herald was in charge. The physical renovation and expansion of the department was completed early in the fiscal year, and the incorporation of the Vanderbilt fishes was finished in May, 1969. The Vanderbilt collection was the largest and most important sampling of tropical Indo-Pacific fishes ever made. It contained 45,000 specimen lots (series of specimens of the same species). With the Vanderbilt material the Department of Ichthyology now has 85,000 specimen lots, and it is one of the ten or twelve largest collections in the world. Arrangements have been made with Stanford University for the transfer of the 70,000-bottle university collection to the Academy, and a proposal for a grant of \$88,990 for that purpose has been prepared by Drs. Eschmeyer and Herald and submitted to the National Science Foundation.

Dr. Eschmeyer also submitted a research proposal for the study of Indo-Pacific scorpionfishes to the National Science Foundation. The two year project was approved in June, 1969, with support of \$23,000 and a probable starting date of September 1, 1969.

Dr. Eschmeyer, in addition to supervising the merger of the Vanderbilt fishes, continued research on scorpionfishes, during which he visited the Academy of Natural Sciences of Philadelphia and the United States National Museum.

Curator W. I. Follett served as President of the American Society of Ichthyologists and Herpetologists as well as Chairman of the Society's Nomenclature Committee. He continued his ethnoichthyological studies (investigation of fishes used by Indians as evidenced in midden remains) and his work on a list of California fishes in association with Carl L. Hubbs and Lillian J. Dempster. Mr. Follett made 25 field trips in California, Nevada, Arizona, and Baja California in connection with those studies.

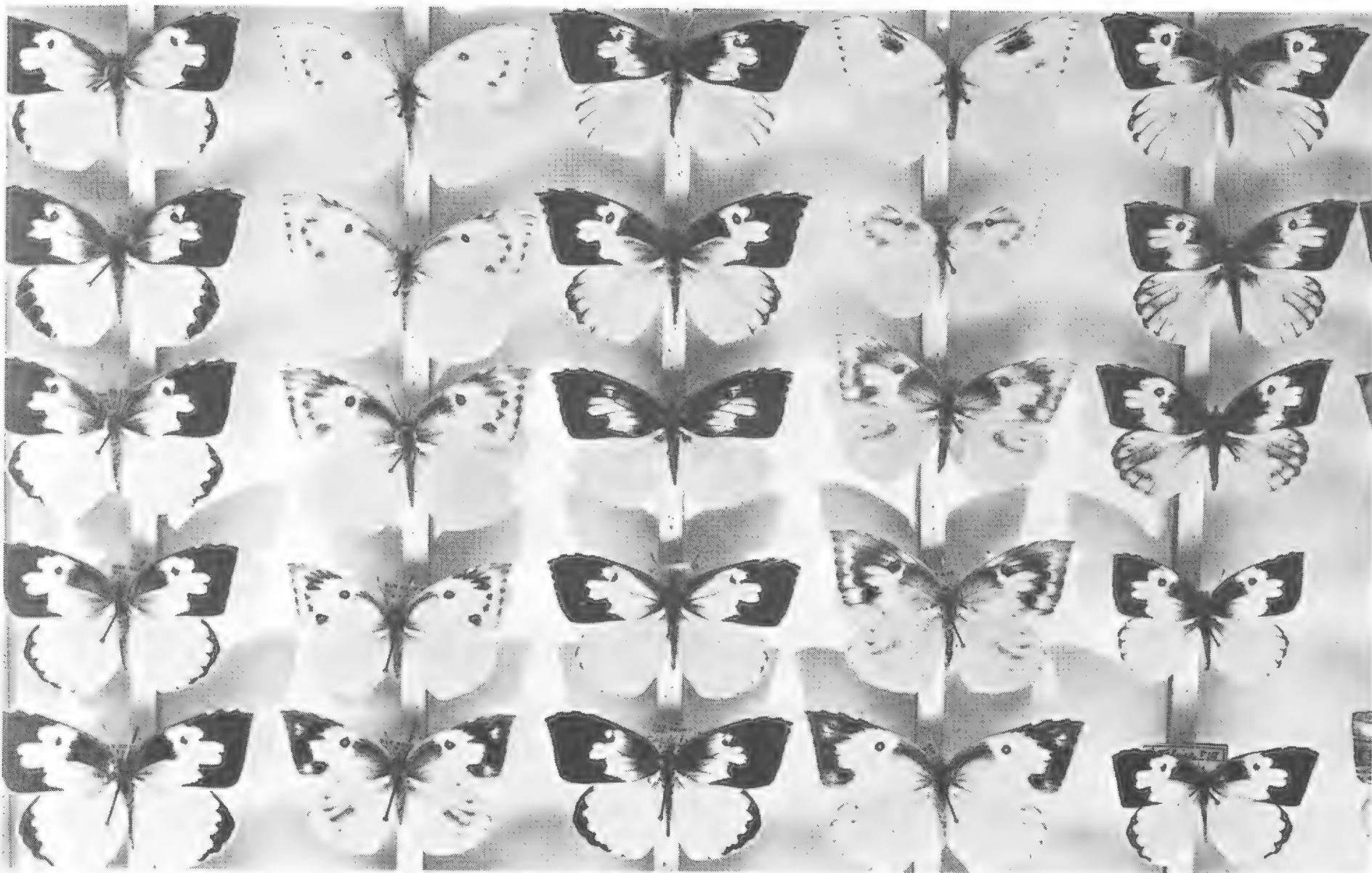
Miss Pearl M. Sonoda handled most of the curatorial duties, which included lending about 4,540 specimens to 43 individuals or institutions, helping visiting scientists who came to use the collection, and general record keeping.

The Ichthyology Department has become one of the most vigorous and active of the Academy, and an important center for studies of fishes.

INVERTEBRATE ZOOLOGY

Allyn G. Smith, Chairman and Associate Curator. The collections are now in excess of 25,000 specimen lots, 1,821 having been accessioned during the year, and there are more than 500 type specimens. The department library contains more than 9,000 specialized scientific papers and 2,010 color transparencies of invertebrate organisms.

A close association exists between the Department of Invertebrate Zoology and the invertebrate paleontology section of the Department of Geology, and personnel of one often work in the other. Mr. Smith studied the Mollusca in the Geology Department's holdings, some of which were dredged in 1901 by the San Diego Biological Association,



Left, there are more than 4,000,000 specimens in the Department of Entomology. Below, Field Associate in Herpetology Ted Papenfuss shows department chairman Alan E. Leviton, left, and Associate Curator Steven C. Anderson the route of his collecting trip in Africa.

which later became Scripps Institution of Oceanography, and some of which were from the collections of Professor Josiah Keep. Mr. Smith is President of the Institute of Malacology and received the Award of Honor of the American Malacological Union, Pacific Division, for outstanding contributions in the field of malacology.

Mr. Chivers was primarily responsible for the training and supervision of assistant personnel, hospitality for visiting researchers, and student tours.

The Department of Invertebrate Zoology, which moved into its present quarters only six years ago, has expanded rapidly and is now in critical need of more space. It has easily recognized symptoms: specimen cases lining public hallways, a crowded laboratory, congested offices, and inadequate shelf space in the collection room to hold all of the jars. The expansion of this department is related to the proposed expansion of the Herpetology Department, which will enable it to release space adjacent to and logically a part of the Invertebrate Zoology Department.

ORNITHOLOGY AND MAMMALOLOGY

Robert T. Orr, Chairman and Curator. During the year the department received 406 specimens: 275 mammals, 128 birds, and three nests with eggs. There are about 82,000 birds, 19,375 mammals, and 7,000 egg sets in the department's holdings.

Dr. Laurence C. Binford joined the staff as Assistant Curator on September 1, 1968 and subsequently assisted greatly in directing curatorial activities. He incorporated the James Moffitt Tahoe bird collection, which had been catalogued by Mrs. Joy Bailey Osborne, into the main collection and identified and catalogued the 1,098 specimen Anatole S. Loukashkin Manchurian bird collection. Dr. Binford obtained his doctoral degree at Louisiana State University. His thesis was on the ecological distribution of birds in the state of Oaxaca, Mexico.





Left, Curator Leo G. Hertlein of the Department of Geology elected to retire at the end of this fiscal year after forty-four years of service. Dr. Hertlein will continue his research activities as Curator Emeritus. Below, a chiton from Mazatlan, Mexico, was of special interest to Allyn G. Smith, an authority on these animals and Chairman of the Department of Invertebrate Zoology. Right, a Hall of Honor was established to recognize the generous individuals who have made and are making possible the work of the California Academy of Sciences.

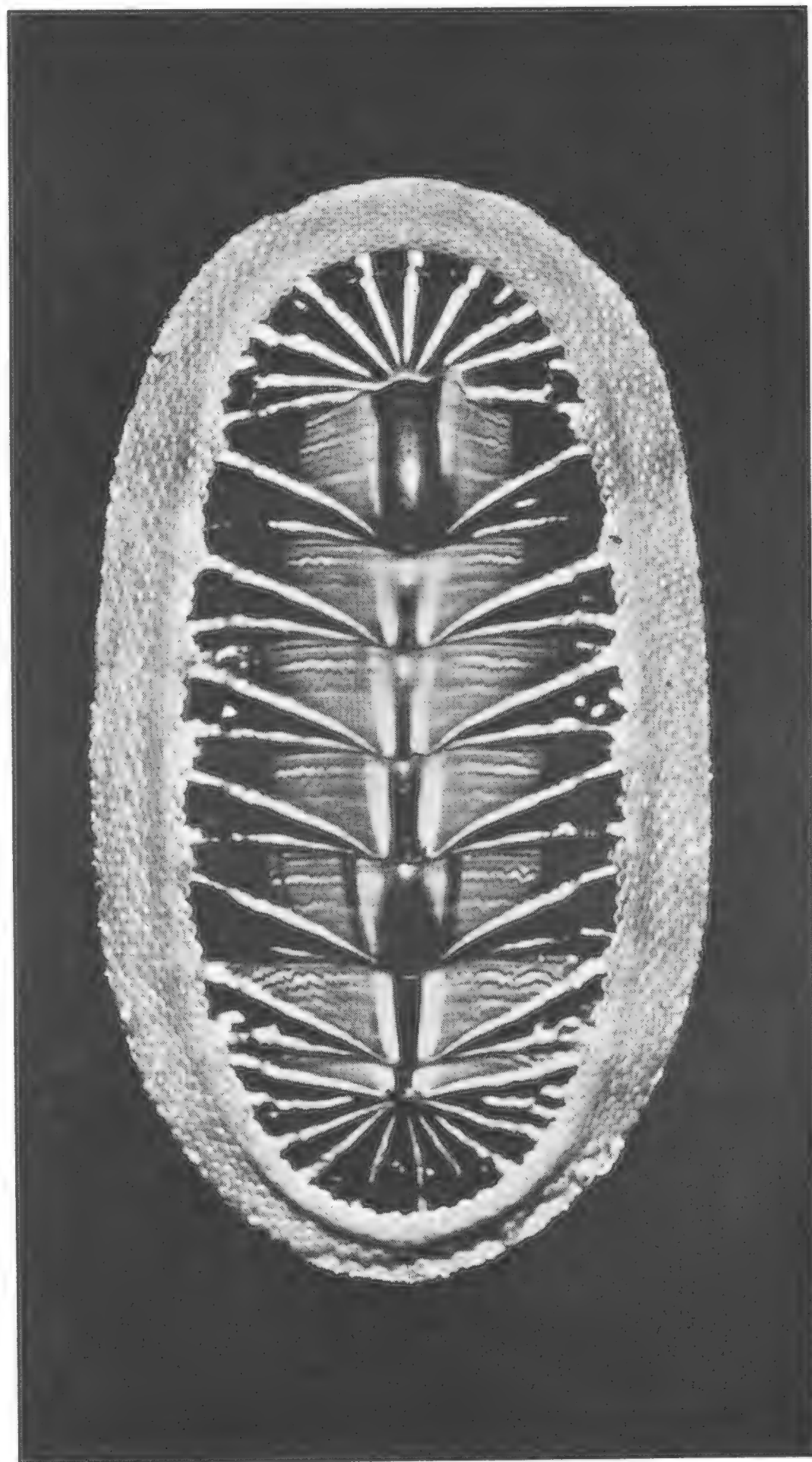
Mrs. Jacqueline Schonewald took care of the mammal collection and the cataloguing of more than 1,000 specimens. She also planned the remodeling of one of the laboratories so that it now accommodates four workers, was responsible for loans of specimens, arranged for purchases of supplies, and assisted Dr. Orr and Research Associate Dr. Arnold with several research problems. Mrs. Schonewald also did the preliminary planning and assisted in all phases of the selection of the furniture for the administrative and other offices in Cowell Hall.

Mrs. Jean Firby joined the staff as Senior Curatorial Assistant under the National Science Foundation support grant in April, and Michael Garrett and Marilou Person continued their positions as Curatorial Assistants under the EOA Work-Study Program contract with San Francisco State College.

Mrs. Charlotte Dorsey, Secretary, divided her time equally between the Department of Ornithology and Mammalogy and the Department of Herpetology. Mrs. Joy Bailey Osborne, Miss Muriel French, and Miss Madelaine Waddell continued to contribute their very valuable services to the department.

Dr. Orr directed the general activities of the department and also devoted much of his time to general Academy administrative work as Associate Director. During the year he completed the manuscript on "The Birds of the Lake Tahoe Region" begun fifty years ago by John Ward Mailliard and James Moffitt, and completed the manuscript for a book "The Story of Migration" to be published by the Macmillan Company. In the fall of 1968 the University of California Press published the field guide "The Mushrooms and Other Common Fungi of Southern California" by Dr. Orr and his wife Dorothy.

Dr. Orr served as President of the Cooper Ornithological Society, Graduate Advisor in the Department of Biology at the University of San Francisco, Director of the American Society of Mammalogists, and on the Advisory





Boards of the Charles Darwin Foundation for the Galápagos Isles, and the Point Reyes Bird Observatory. He was awarded Honorary Membership in the Cooper Ornithological Society, the highest honor it confers on ornithologists.

SCIENTIFIC PUBLICATIONS

Edward L. Kessel, Editor. Research without publication of its results would be sterile. An original purpose of the Academy in 1853 was the publication of scientific papers, and that activity has been continuous to this day. The output for the report year was 773 pages; the *Occasional Papers* had 7 papers and 62 pages, and there were 23 papers with 711 pages in the *Proceedings*.

Mrs. G Dallas Hanna and Mrs. Ira L. Wiggins volunteered many weeks of help in preparing indexes for recently completed volumes of the *Proceedings*, and Lysbeth Fritz assisted Editorial Assistant Winifred O'Neill ready them for the printer. Dr. Leo G. Hertlein assisted with editorial work, and with George Lindsay and Edward Kessel served on the Scientific Publication Committee.

The editorial offices were moved to conveniently located larger and more attractive and comfortable quarters near the administrative wing. The policy of accepting payment for page charges was initiated, although availability of funds for this purpose is not a factor in the acceptance or rejection of a paper for publication.

WORK STUDY PROGRAM

The EOA program of the Department of Health, Education and Welfare provides financial assistance to students who might otherwise be unable to attend college. The Academy, under contracts with the University of California and San Francisco State College, employed 40 students dur-

ing the report year, and they worked 13,293 hours and earned \$30,111 of which the Academy furnished \$6,022. Thus, for the salary of one full-time technician the Academy had the equivalent of seven full-time curatorial assistants on the staff. More important, the students had an opportunity to gain valuable work experience and technical training in the research departments and scientific library. Dr. Alan E. Leviton was in charge of the EOA program at the Academy.

DEVELOPMENT

Michael J. Kearney, Associate Director for Development. This newly established office has responsibility for the long range development and financing of the Academy and for the continuing programs for corporate, foundation and individual support.

During the year a new affiliate group, the Friends of the Academy, was organized under the chairmanship of Trustee John A. Sutro. It is a voluntary association of men and women interested in the growth and development of our institution and through it the promotion of research, encouragement of scientific careers for the young, and interpretation of the natural world for the many. We are very grateful to those who became members of the Friends of the Academy during this past year.

George E. Lindsay

GEORGE E. LINDSAY
Director

STAFF

(as of June 30, 1969)

George E. Lindsay, *Director*
Robert T. Orr, *Associate Director*
Earl S. Herald, *Associate Director for the Aquarium*
Michael J. Kearney, *Associate Director for Development*
Robert E. McClure, *Business Manager*
Vashti F. Hawley, *Office Manager*
Lysbeth Fritz, *Secretary to the Director*
Robert C. Miller, *Senior Scientist*

AQUATIC BIOLOGY (STEINHART AQUARIUM)

Earl S. Herald, *Chairman and Associate Director for the Aquarium*
Robert P. Dempster, *Assistant Superintendent*
Glenn E. Burghardt, *Senior Aquatic Biologist*
Lloyd Gomez, *Aquatic Biologist*
Richard Shopen, *Aquatic Biologist*
Karl H. Switak, *Aquatic Biologist (Herpetologist)*
Tom Tucker, *Aquatic Biologist*
Norval J. Green, *Senior Aquarist*
John R. Dillon, *Aquarist*
Frederick W. Herms, *Aquarist*
William F. Rohrs, *Aquarist*
W. Walter Schneebeil, *Aquatic Collector*
Willet J. Brown, *Aquarium Exhibits Preparator*
Phyllis J. Ensrud, *Secretary*
Donald Taylor, *Curatorial Assistant, EOA*
Maud Pearson, *Lab Technician*
Sarane Bowen, *Research Associate*
Fredric L. Frye, *Research Associate*
Marjorie Hunt, *Research Associate*
John Mizelle, *Research Associate*
Ben W. Papermaster, *Research Associate*
William Shipman, *Research Associate*

ASTRONOMY (MORRISON PLANETARIUM)

Robert D. Risser, *Supervisor*
Richard D. Warren, *Assistant Supervisor*
Steven B. Craig, *Chief Technician*
John H. Leonberger, *Assistant Technician*
Elizabeth Javens, *Secretary*
Thomas McDonough, *Lecturing Assistant*
Kenneth A. Patterson, *Lecturing Assistant*
David W. Todd, Jr., *Instructor*
Michael A. Bennett, *Lecturer*
Hubert J. Bernhard, *Lecturer*
Charles F. Hagar, *Lecturer*
Anna Critchlow, *Cashier*
Marjorie Critchlow, *Cashier*
Dawn Klevesahl, *Cashier*
Jill McKenzie, *Cashier*
Ingo Orlamunder, *Head Usher and Projectionist*
Peter Stein, *Usher*
Italo Tulipano, *Usher*
Peter Wilde, *Usher*
Clay P. Butler, *Research Associate*

BOTANY

Elizabeth McClintock, *Acting Chairman and Curator*
John Thomas Howell, *Curator Emeritus*
Virginia Moore, *Senior Curatorial Assistant*
Claire Etienne, *Curatorial Assistant*
Saichi Kawahara, *Curatorial Assistant*
Anita Noldeke, *Curatorial Assistant*
Barbara Trowbridge, *Curatorial Assistant*
Robert Setzer, *Curatorial Assistant, NSF*
Barbara Shervanick, *Curatorial Assistant, NSF*
Judy Murray, *Curatorial Assistant, EOA*
Frank Yamasaki, *Curatorial Assistant, EOA*
Clare B. Hardham, *Research Associate*
Robert F. Hoover, *Research Assistant*
Hans Leschke, *Research Associate*
Henry M. Polland, *Research Associate*
Lewis S. Rose, *Research Associate*
Gordon H. True, *Research Associate*
Ernest C. Twisselmann, *Research Associate*
Ira L. Wiggins, *Research Associate*
Beatrice F. Howitt, *Field Associate*

DEVELOPMENT

Michael J. Kearney, *Associate Director for Development*
E. Sue Weaver, *Membership Coordinator*
Shari E. Lewis, *Secretary*

ENTOMOLOGY

Paul H. Arnaud, Jr., *Chairman and Associate Curator*
Edward S. Ross, *Curator*
Edward S. Kessel, *Associate Curator*
Hugh B. Leech, *Associate Curator*
Stella E. Tatro, *Secretary-Curatorial Assistant*
Lynne A. Warner, *Typist*
Lillian M. Weeder, *Typist*
Paul S. Bartholomew, *Curatorial Assistant*
Thomas W. Davies, *Curatorial Assistant*
Barbara A. Wilson, *Curatorial Assistant*
Lydia Eschmeyer, *Curatorial Assistant, NSF*
Larry A. Gormley, *Curatorial Assistant, NSF*
LaVerne A. Trautz, *Curatorial Assistant, NSF*

Bruce L. Campbell, *Curatorial Assistant, EOA*
Robert B. Johnson, *Curatorial Assistant, EOA*
Burton Naiditch, *Curatorial Assistant, EOA*
Harold J. Pavelka, *Curatorial Assistant, EOA*
Julio Rossetti, *Curatorial Assistant, EOA*
J. Linsley Gressitt, *Research Associate*
Hartford H. Keifer, *Research Associate*
Dyrce Lacombe, *Research Associate*
E. Gorton Linsley, *Research Associate*
Cornelius B. Philip, *Research Associate*
Joseph Wilcox, *Research Associate*
Stanley C. Williams, *Research Associate*
Thomas S. Briggs, *Field Associate*
Don Patterson, *Field Associate*
David C. Rentz, *Associate*

EXHIBITS

Ernest R. Rook, *Chairman and Curator*
Herbert E. Pruett, *Assistant*
Richard Cook, *Assistant*
Jerry F. Glover, *Assistant*
Konstantin Kurkin, *Cabinetmaker*
Herbert Swanson, *Assistant Cabinetmaker*
Alberto A. Cacicedo, *Assistant*
Gary Giuliani
Ronald Bjorkland
Verdi Miller, *Associate*

GEOLOGY

Victor A. Zullo, *Chairman and Associate Curator*
G Dallas Hanna, *Curator of Geology*
Leo G. Hertlein, *Curator of Invertebrate Paleontology*
Enid Cook, *Secretary*
Elaine Jannis, *Secretary*
Merna Figoten, *Secretary*
Barry Roth, *Curatorial Assistant, NSF*
Gordon Wright, *Curatorial Assistant, EOA*
William Kooser, *Curatorial Assistant, EOA*
Charles W. Chesterman, *Honorary Curator of Minerals*
A. L. Brigger, *Research Associate*
Clifford C. Church, *Research Associate*
Eugene V. Coan, *Research Associate*
Alan J. Galloway, *Research Associate*
York T. Mandra, *Research Associate*

HERPETOLOGY

Alan E. Leviton, *Chairman and Curator*
Steven C. Anderson, *Associate Curator*
Charlotte H. Dorsey, *Secretary*
James Harvey, *Curatorial Assistant, NSF*
Marilyn Kramer, *Curatorial Assistant, EOA*
Jean Jahnsen, *Curatorial Assistant, EOA*
Linette Sabre, *Curatorial Assistant, EOA*
Walter C. Brown, *Research Associate*
Harold Cogger, *Research Associate*
James R. Dixon, *Research Associate*
David L. Jameson, *Research Associate*
Malcolm R. Miller, *Research Associate*
George S. Myers, *Research Associate*
Lawrence W. Swan, *Research Associate*
Erica Clark, *Field Associate*
Richard J. Clark, *Field Associate*
John Gasperetti, *Field Associate*

HOROLOGY

Bruce A. Kock, *Honorary Curator*

ICHTHYOLOGY

William N. Eschmeyer, *Chairman and Associate Curator*
W. I. Follett, *Curator*
Earl S. Herald, *Curator*
Lillian J. Dempster, *Associate Curator*
Pearl M. Sonoda, *Senior Scientific Assistant*
David T. Anderson, *Curatorial Assistant, EOA*
Eugene Trousdale, *Curatorial Assistant, EOA*
Margaret G. Bradbury, *Research Associate*
Carl L. Hubbs, *Research Associate*
Giles Mead, *Research Associate*
George S. Myers, *Research Associate*
Anatole S. Loukashkin, *Research Biologist*

INSTRUMENT SHOP

Steven B. Craig, *Superintendent*
Frank K. Talbert, *Machinist*
Peter P. Tebneff, *Chief Installer*
Uldarico Gontenas, *Assistant*
Frank Ramirez, *Electrician*

INVERTEBRATE ZOOLOGY

Robert C. Miller, *Curator*
Allyn G. Smith, *Associate Curator*
Dustin D. Chivers, *Assistant Curator*
Dea D. Beach, *Curatorial Assistant, NSF*
William G. Nichols, *Curatorial Assistant, EOA*
Stephanie Rainsford, *Curatorial Assistant, EOA*
Bonnie Sanders, *Curatorial Assistant, EOA*
Francis F. Filice, *Research Associate*
A. Myra Keen, *Research Associate*
Franz B. Steiner, *Field Associate*
Robert R. Talmadge, *Field Associate*
James T. Carlton, *Associate*

JUNIOR ACADEMY

Kenneth Lucas, *Supervisor*
Darrel McKenzie, *Instructor*

LIBRARY

Ray Brian, *Librarian*
Clara Gross, *Assistant Librarian*
Doris Cantou, *Senior Library Assistant*
Mary Stilwell, *Senior Library Assistant*
Laurie Umeh, *Library Assistant*
Camille Benet, *Student Assistant, EOA*
Charles Durege, *Student Assistant, EOA*
John Crowl, *Student Assistant, EOA*
Fred Gillette, *Student Assistant, EOA*
Marilyn Johe, *Student Assistant, EOA*
Julian Stamper, *Student Assistant, EOA*
Julian Arntz, *Library Associate*
Margaret W. Campbell, *Library Associate*
Anson Herrick, *Library Associate*
Jessie Saunders, *Library Associate*

MAINTENANCE AND OPERATION

William L. Denevi, *Chief Stationary Engineer*
George F. Murphy, *Senior Stationary Engineer*
Andrew J. Bell, *Stationary Engineer*
John V. Daley, *Stationary Engineer*
Albert Kravitz, *Stationary Engineer*
John E. Weaver, *Stationary Engineer*
Carmelo Vernale, *Stationary Engineer*
Larry J. Carty, *Engineer Assistant, EOA*
Floyd James, *Janitor Subforeman*
Rachel Wortherly, *Janitress*
Francisco Boritz, *Janitor*
Nathan C. Cole, *Janitor*
Bernard Conlon, *Janitor*
James Jackson, Jr., *Janitor*
Eugenio Luis, *Janitor*
Thomas C. McCance, *Janitor*
Ollie C. Wallace, *Janitor*

OFFICE

Vashti F. Hawley, *Office Manager*
Diane L. Baker, *Accountant*
Olive T. Lucich, *Assistant Bookkeeper*
Marian Ganapol, *Membership Secretary*
Irene Clayton, *Assistant*
Dorothy N. Lohmeyer, *PBX Receptionist*
Glen S. Hayden, *Assistant*
Robert Bjorkland
Gerald Del Rio

ORNITHOLOGY AND MAMMALOLOGY

Robert T. Orr, *Chairman and Associate Director*
Laurence C. Binford, *Assistant Curator*
Jacqueline Schonewald, *Senior Scientific Assistant*
Charlotte H. Dorsey, *Secretary*
Jean Firby, *Senior Curatorial Assistant, NSF*

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Marilou Person, *Curatorial Assistant, EOA*
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The accompanying notes are an integral part of the financial statements.

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STATEMENT OF CHANGE IN UNRESTRICTED
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FOR THE YEARS ENDED JUNE 30, 1969 AND 1968

	1969	1968
INCOME FROM		
Contributions		
Membership dues	\$ 46,706	\$ 47,411
Business organizations (Note 6)	44,165	49,487
Individuals and trusts	26,687	21,943
	<u>117,558</u>	<u>118,841</u>
Interest, dividends and overhead		
reimbursements		
Contract research fund	22,885	16,589
Endowment fund	65,665	62,825
Special purposes fund	44,052	28,957
	<u>132,602</u>	<u>108,371</u>
Operations		
From the City and County of		
San Francisco for support of		
aquarium and museum		
operations	524,490	485,923
Rent from Commercial Building	149,384	154,412
Planetarium	120,588	113,409
Television	3,834	9,007
Restaurant royalty	36,582	35,802
Sundry sales	102,386	121,519
Other	37,956	31,689
	<u>975,220</u>	<u>951,761</u>
Total income	1,225,380	1,178,973
DEDUCT EXPENDITURES		
Aquarium and museum	542,059	515,708
Planetarium	81,710	63,839
Departmental research and		
curatorial activities	281,591	274,610
General and administrative	270,347	228,473
Cost of sundry sales	104,579	117,072
Employees' pension annuity	15,706	19,204
Interest	13,562	12,810
Total expenditures	<u>1,309,554</u>	<u>1,231,716</u>
Excess of expenditures		
over income	(84,174)	(52,743)
APPROPRIATIONS FROM		
OTHER FUNDS		
Endowment fund	85,000	—
Special purposes fund	23,774	12,673
	<u>108,774</u>	<u>12,673</u>
Net increase (decrease)		
in unrestricted		
operating fund	24,600	(40,070)
UNRESTRICTED OPERATING		
FUND BALANCE		
July 1	70,034	110,104
June 30	<u>\$ 94,634</u>	<u>\$ 70,034</u>

The accompanying notes are an integral part of the financial statements.

CALIFORNIA ACADEMY OF SCIENCES
COMBINED STATEMENT OF CHANGE IN FUND BALANCES
FOR THE YEARS ENDED JUNE 30, 1969 AND 1968

	1969	1968
Fund balances, July 1		
As previously reported	\$3,521,672	\$3,591,269
Adjustment to eliminate historical cost amounts, which are no longer meaningful, for Collections, Library and Equipment	(968,307)	(958,984)
As restated	2,553,365	2,632,285
Amounts added to Collections, Library and Equipment	(10,362)	(9,323)
Net increase (decrease) in fund balances (Note 6)	268,614	(69,597)
Fund balances, June 30	<u>\$2,811,617</u>	<u>\$2,553,365</u>

The accompanying notes are an integral part of the financial statements.

NOTES TO FINANCIAL STATEMENTS

JUNE 30, 1969

1. Accounting Method

The Academy has established the practice of recording gifts and bequests only when received.

2. Buildings

No amount appears on the balance sheet for buildings because under the terms of the Charter of the City of San Francisco, no one other than the City may own buildings on City property. Thus, as the Academy facilities in Golden Gate Park (which is City property) were acquired, title was transferred to the City of San Francisco.

The cost of buildings transferred to the City to date is \$2,354,362. A recent addition to the Academy, Cowell Hall, recently completed at a cost of \$1,545,237 has not yet been transferred.

The appraised value of buildings, excluding Cowell Hall, was determined by independent appraisal in 1968.

3. Unexpended Construction Funds

The H. S. Cowell Foundation committed a total of \$1,545,237 to the Academy for a new building in 1967. Construction of Cowell Hall was completed in April, 1969.

The balance of unexpended construction funds represents the net of commitment received to date of \$1,545,237 and payments and accrued costs of \$1,365,394. These net funds are temporarily held in a savings account, and were disbursed in July, 1969.

4. Employees' Pension Annuity

On January 1, 1964, the Academy adopted an annuity plan for all regular full-time staff members under the age of 59 on that date.

Contributions to this retirement plan are 5% of employees' salary to \$7,800, and 7.5% of salary over that. The pension annuity expense was \$15,706 for the current year. There is no past service liability and it is the Academy's policy to fund current pension costs.

5. Securities

Market values for securities were determined by the trust department of Crocker-Citizens National Bank using closing market quotations as of June 30, 1969.

6. Contributions

There were contributions from business organizations amounting to \$7,500 which were committed under the Academy's corporate support program prior to the end of the fiscal year, but were not received until July, 1969. Under the method of accounting described in Note 1 these will be reflected in next year's financial statements.

The net increase of \$268,614 in the total fund balances includes three unusually large gifts to the Endowment and Special Purposes funds as follows:

Estate of C. M. Goethe	\$178,808
Estate of V. N. Drown	113,566
Anonymous gift from a trustee	81,200

\$373,574

ACCOUNTANTS' REPORT

The Board of Trustees
California Academy of Sciences
San Francisco, California

We have examined the combined balance sheet of the California Academy of Sciences as of June 30, 1969 and the related combined statement of change in fund balances for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying combined balance sheet and the related combined statement of change in fund balances present fairly the financial position of the California Academy of Sciences at June 30, 1969, and the results of its activities for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

HURDMAN AND CRANSTOUN, PENNEY & Co.

San Francisco, California
July 31, 1969

YOU MAY WILL IT

The Academy's scientific research and educational work is dependent upon the financial support of its friends. Gifts may be made in many ways: in cash, securities or other property.

Bequests in any amount to the Academy are free from federal estate tax. Since estate tax rates are graduated, a bequest to the Academy removes from the taxable estate funds or property which otherwise would be taxed at the highest rate.

A form of bequest, one of many possible examples, is on the reverse side. We will gladly discuss any of these methods of giving with you and your attorney confidentially and without obligation.

FORM OF BEQUEST

I give and bequeath to the California Academy of Sciences*,
Golden Gate Park, San Francisco, the sum of \$.
for such purposes as the Trustees of the organization determine.

.

signature

* Legal name

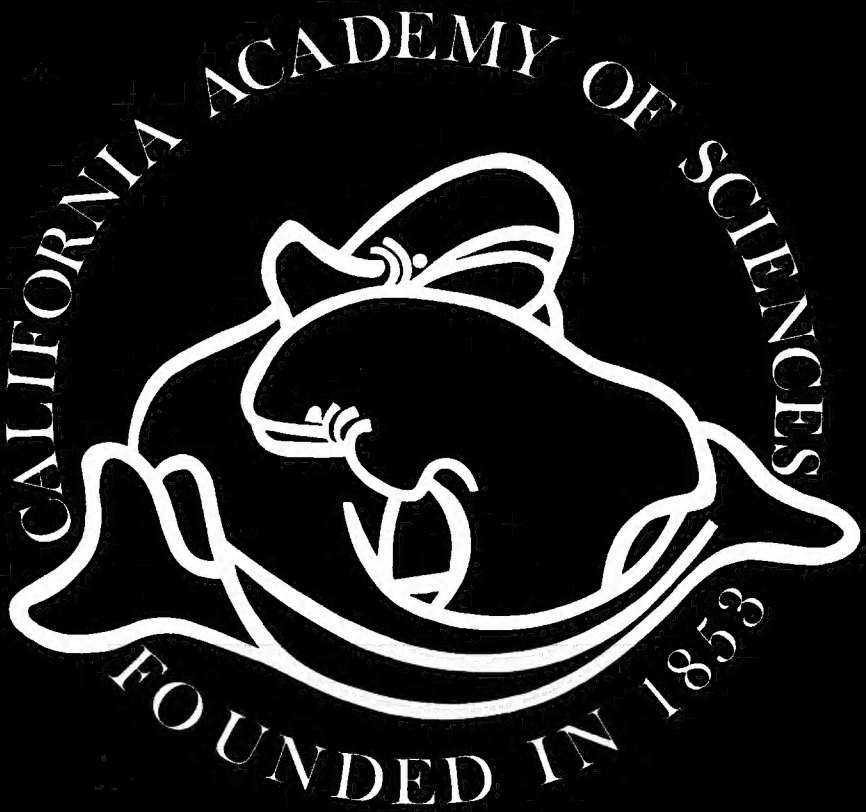
GIFTS AND BEQUESTS

GIFTS and bequests to the Academy may be made in different ways, many with special advantages to the donor depending on individual circumstances. To name a few: gifts of securities or real property, gifts of life insurance, donative sale of appreciated assets, and gifts through a closely held or family corporation.

You or your attorney may obtain further information on these various methods of helping the Academy's work from any Trustee or the Director of the Academy. There are many ways in which a donor's intentions can be accomplished and we stand ready to discuss them with you.

RETAINED LIFE INCOME: A WAY TO HELP THE ACADEMY AND YOURSELF

Through a life income trust you can make a gift of cash, securities or real property to the California Academy of Sciences, continue to receive income earned by the assets you give, and obtain immediate tax benefits.



CALIFORNIA ACADEMY OF SCIENCES
GOLDEN GATE PARK, SAN FRANCISCO, CALIFORNIA 94118